

Grand Canyon Monitoring and Research Center

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U.S. Geological Survey

Federal Efforts to Protect Grand Canyon

The Grand Canyon of the Colorado River, one of the world's most spectacular gorges, is a premier U.S. National Park and a World Heritage Site. The canyon supports a diverse array of distinctive plants and animals and contains cultural resources significant to the region's Native Americans.

About 15 miles upstream of Grand Canyon National Park sits Glen Canyon Dam, completed in 1963, which created Lake Powell. The dam provides hydroelectric power for 200 wholesale customers in six western States, but it has also altered the Colorado River's flow, temperature, and sediment-carrying capacity. Over time this has resulted in beach erosion, invasion and expansion of nonnative species, and losses of native fish.

Public concern about the effects of Glen Canyon Dam operations prompted the passage of the Grand Canyon Protection Act of 1992, which directs the Secretary of the Interior to operate the dam "to protect, mitigate adverse impacts to, and improve values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established..."



U.S. Geological Survey

This legislation also required the creation of a long-term monitoring and research program to provide information that could inform decisions related to dam operations and protection of downstream resources.

Glen Canyon Dam Adaptive Management Program

To mitigate the impacts of dam operations on downstream resources, the Secretary of the Interior signed a formal decision in 1996 that altered historical flows from the dam and established the Glen Canyon Dam Adaptive Management Program. Adaptive management, also

known as "learning by doing," is a way to evaluate and revise management actions as new information becomes available. Science—in the context of adaptive management—is the "compass" used to chart such changes in course.



Dave Walsh, Bureau of Reclamation

The adaptive management program is facilitated by the 25-member Adaptive Management Work Group, a Federal Advisory Committee that provides recommendations on the operation of Glen Canyon Dam to the Secretary of the Interior. The group includes representatives from Native American Tribes, Federal and State resource agencies, Colorado River Basin States, and nongovernmental groups.

Grand Canyon Monitoring and Research Center

Established in 1995 to meet the mandates of the 1992 legislation, the Grand Canyon Monitoring and Research Center (GCMRC) of the U.S. Geological Survey (USGS) is today the science provider to the Glen Canyon Dam Adaptive Management Program. In this role, the GCMRC provides relevant scientific information about the status and recent trends of important natural, cultural, and recreational resources affected by the operational regime in place at Glen Canyon Dam since 1996.



Paul Alley, U.S. Geological Survey

The GCMRC focuses its efforts on three primary activities:

Monitoring

Consistent, long-term repeated measurements are undertaken using scientifically accepted protocols to measure status and trends of key resources, including native and nonnative fishes, sandbars, water quality, aquatic food base, riparian vegetation, and cultural sites.

Research and Development

Research and development activities address specific hypotheses related to key resources and develop and test new technologies or monitoring procedures.

Experimentation

Experiments are conducted to determine how releases from Glen Canyon Dam and other management actions can be used to meet key resource goals. The GCMRC is best known for a series of three high-flow experiments, or water releases designed to mimic natural seasonal flooding, conducted in 1996, 2004, and 2008, to learn if flows can be used to restore sandbars and wildlife habitat.

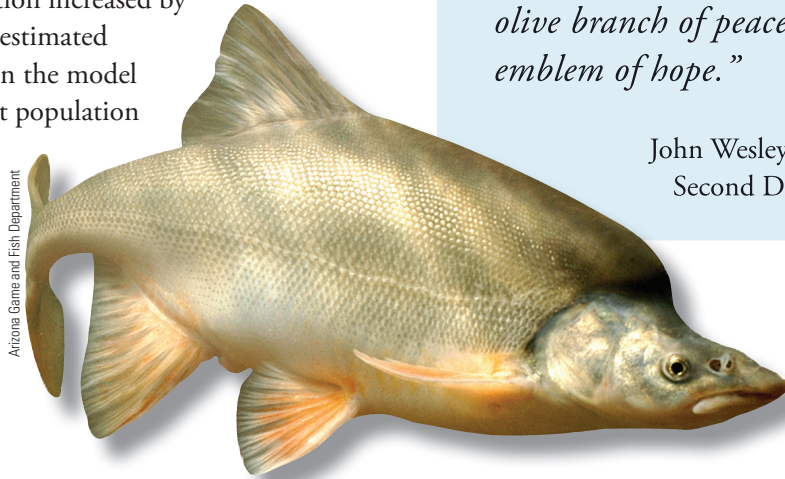


Jeff Sorensen, Arizona Game and Fish Department

Major Conclusions from Research to Date

Humpback chub

The USGS has developed and used a computer model to assess the Grand Canyon humpback chub population status and trends from 1989 to 2008. Reproductively mature humpback chub (4 years old and older) appear to have decreased from 1989 to about 2001, when the population stabilized around 5,000 adults. From 2001 to 2008, the adult population increased by approximately 50 percent to an estimated 7,650 individuals. Uncertainty in the model estimate means the current adult population is likely between 6,000 and 10,000 individuals. The observed increasing trend could be the result of drought-induced warming, removal of nonnative fish, or a combination of these and other factors.



“Let us raise science aloft as the olive branch of peace and the emblem of hope.”

John Wesley Powell, 1882
Second Director, USGS

Sandbars

Sandbars and camping beaches continue to erode under typical Glen Canyon Dam operations. Substantial increases in canyon sandbars are only possible with short-duration high-flow releases timed to take advantage of sand provided by tributaries downstream of the dam following seasonal flooding. The sustainability of newly created sandbars depends on the pattern of releases from the dam between these high-flow releases.



GCMRC mission statement

The mission of the Grand Canyon Monitoring and Research Center is to provide credible, objective scientific information to the Glen Canyon Dam Adaptive Management Program about the effects of (1) Glen Canyon Dam operations and other related factors on downstream natural, cultural, and recreational resources using an ecosystem approach and (2) flow and nonflow measures to mitigate adverse impacts.

In pursuing its mission, the GCMRC works closely and cooperatively with a wide range of Federal, State and Tribal resource management agencies; academic institutions; and private consultants.

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